



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/115,444	07/14/98	CHEN	F T1S-25912

023494 MMC2/1023  
TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS TX 75265

EXAMINER	
FOSTER, D	
ART UNIT	PAPER NUMBER
2841	

**DATE MAILED:** 10/23/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Notice of Allowability

Application No.

09/115,444

Applicant(s)

Chen et al.

Examiner

David Foster

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--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/24/2001.
2. ☒ The allowed claim(s) is/are 1-22.
3. ☒ The drawings filed on Jan 19, 2001 are acceptable as formal drawings.
4. ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).  
a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).  
\*Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION.** This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).

6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7. ☐ Applicant MUST submit NEW FORMAL DRAWINGS  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.  
(b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the examiner.  
(c) ☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

## Attachment(s)

- |  |   |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____             |
| 5 <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449), Paper No(s). _____          | 6 <input type="checkbox"/> Examiner's Amendment/Comment                             |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 9 <input type="checkbox"/> Other   |   |

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**DETAILED ACTION**

**HIGH DENSITY INTERNAL BALL GRID ARRAY INTEGRATED CIRCUIT**

**PACKAGE**

**Chen et al.**

*Allowable Subject Matter*

1. Claims 1-22 are allowed.
2. The following is an examiner's statement of reasons for allowance: Cited prior art does not teach nor suggest a combination of an interconnect structure for a semiconductor chip having a substrate with a plurality of pads, routing strips, wire bonding, a chip wherein the electrical conductors are physically attached to the chip and bonding pads such that each bonding pad is aligned with openings in the substrate between bonding pads and routing strips.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The best art to consider with this application can be found in: Yamaguchi

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(5,886,876), Marcantonio (5,796,170), Takamichi et al. (6,054,755), Ha et al. (5,767,446), Chia et al. (5,973,393), Selna (5,640,048), Gaudenzi et al. (5,313,366), Hoppe (4,843,225).

Yamaguchi discloses a surface mounted semiconductor package having a substrate with a stacked structure wherein the semiconductor device mounted on the top of the substrate and provided with electrode pads, Marcantonio discloses BGA integrated circuit having a vent hole, substrate, pads and ball grid array, Takamichi et al. disclose a semiconductor package with moisture vapor relief wherein moisture vapor in the package is released outside through the vent hole, Ha et al. disclose a semiconductor package having a substrate, chip, ball grid and a molded seal, Chia et al. disclose an apparatus and method for packaging and IC, Selna discloses a three-layer BGA package having vias, Gaudenzi et al. disclose a surface mount carrier, pads, a chip and solder balls and Hoppe discloses an identification card with and IC wherein polymer is injected in the cavity. However, none of the above cited prior have the overall combination of an interconnect structure for a semiconductor chip having a substrate with a plurality of pads, routing strips, wire bonding, a chip wherein the electrical conductors are physically attached to the chip and bonding pads such that each bonding pad is aligned with openings in the substrate between bonding pads and routing strips as does applicant.

4. Any inquiry concerning to this communication or earlier communications from the Examiner should be directed to David Foster whose telephone number is (703) 308-1763. The examiner can normally be reached on Monday through Thursday and alternate Fridays.

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If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Leo P. Picard, who can be reached on (703) 308-0538. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DAF

October 16, 2001

A handwritten signature in black ink, appearing to read "Leo P. Picard", is written diagonally across the page.

**Leo P. Picard**  
**Supervisory Patent Examiner**  
**Technology Center 2800**